

Drought Tolerant Okra for the Ashanti, Volta and Bono Regions in Ghana



Jacinta Adoma Opoku

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Design target

Okra with tolerance to drought stress.

Jacinta Adoma Opoku is a distinguished plant breeder and researcher, currently serving as the Lead Okra Breeder at CSIR-Crops Research Institute. With a passion for advancing plant breeding, Jacinta completed her PhD in Plant Breeding at WACCI in 2023. Her thesis was entitled “Genetic Variability and Drought Tolerance in okra (*Abelmoschus esculentus* L. Moench)”. She developed F₂ seeds of drought-tolerant genotypes which she will continue to cross, evaluate and advance to obtain drought-tolerant okra for farmers.



Product Profile design team

Step 1

PP Design Team Lead/Champion	Jacinta Adoma Opoku CSIR-Crops Research Institute (CSIR-CRI), Kumasi-Ashanti
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PP Design Team		
Person	Area of Expertise	Name of organization
Jacinta Adoma Opoku	Plant breeder	CSIR-CRI
Benedicta Nunoo	Agricultural economist	CSIR-CRI
Agyemang Danquah	Molecular biologist	WACCI, University of Ghana
Isaac Osei-Bonsu	Physiologist/Agronomist	CSIR-CRI
Francis Safo	Field technician	CSIR-CRI
Seth Akomeah	Okra farmer	Private person
Consultation with okra farmers (69), marketers/ retailers (768) and consumers (802)		

Clients and markets

Step 2

Product profile descriptors	
Product profile name	Drought-tolerant okra for fresh market
Crop	Okra
Country(s)	Ghana
Geographic region(s)	Ahafo, Ashanti, Bono East, Bono region, Central, Eastern, Oti, Volta
Market segment and positioning	Fresh okra market. High yielding and long harvesting span okra with tolerance to drought stress
Name of target variety(s) or landrace to be replaced strengths, weaknesses	Asontem
Date PP created (dd.mm.yyyy)	17.07.2023

Target client and use	
Value chain primary clients/customers: farmers, processors, transporters, consumers, etc.	Farmers, retailers, consumers and seed producers
Market scale: households, local, regional, national and international markets	Households, local, regional markets
Use: food, animal feed, energy, medicinal, clothing, etc.	Food and medicinal
Type of processing: none (fresh), dried, cooked, milled, canned, brewed, etc.	None - fresh market
Market class: bean type, wheat quality, etc.	Green to deep green and slimy okra

Target crop producers and production system	
Number of farmers (min–max range)	5000-20000
% ratio: male to female farmers (min–max range)	66-69 % males: 31-34 % females
Production system: open field (+/- irrigation), plastic tunnel, glasshouse, hydroponics	Off-season, open field without irrigation
Area of production system (ha)	2000 - 5000 ha
Growth habit: e.g. beans, tomatoes, grapes (bush, climbing, etc.)	Erect (semi-determinate)
Expected level of inputs: low, medium, high (fertilizer, crop protection chemicals)	Medium use - nutrient management and protection
Typical yield range of target system (e.g. 0.8–1.5 t/ha)	6 - 12 t/ha
Cropping system: continuous monocrop, rotated intercrop, intercrop mixed cropping, etc.	Rotated intercropping with legumes and other vegetables
Mechanization: planting, maintenance and harvesting	None - manual planting, maintenance and harvesting
Agroecological zone(s)	Savanna zones, semi-deciduous forest and transitional
Total seed or vegetative propagation material market (tonnes/numbers)	10-25 kg

Variety technical specification

Step 3

Client/customer	Driver	Trait category	Preference group: Women (W) Men (M) Youth (Y) W+M+Y (All)	Trait demand classification: 1. Essential/"must have" 2. Niche opportunity 3. Added-value 4. Winning trait	Target traits	Trait description (Quantitative measures)	Name of benchmark variety	Performance required compared to benchmark variety <,> etc.
Okra farmers	Productivity	Yield	All	1	Economic yield	Fresh fruit yield > 6 t/ha	Asontem	>
		Biotic stress resistance	M	4	Viruses tolerance	1-5 scale: 4 (severe)	None	None
			All	3	Insect pests	1-9 scale 6 (moderate)	None	None
			M	3	Nematodes	1-9 scale 6 (moderate)	None	None
		Abiotic stress tolerance	All	4	Drought-tolerant	High fruit yield at low water supply	NHAe/47-4	≥
			All	4	Tolerant to poor soil condition	High fruit yield on low fertility soil	None	None
	All		3	Waterlog-tolerant	High fruit yield on waterlogged soil	None	None	
	Crop management and harvesting	Plant architecture	All	1	Growth habit	Erect, semi-determinate	Asontem	=
	Market value and price	Sliming-span	All	1	Fruit sliming span	Mucilage content should be high or moderate	Asontem	≥
		Fruit size/ length	W	3	Slender (5-12 cm long)	Individual fruit length should be between 5 to 12 cm long	JKOH540	=
		Crop duration	All	1	Early maturing	Ready for harvest before 40 days after planting	JKOH540	≤
		Harvesting duration	All	1	Longer harvesting duration	Plant should continue to fruit for not less that two months	Asontem	≥
	Post-harvest storage	Shelf-life	All	3	Longer shelf-life	Store better after one week of harvesting	Asontem	≥
		Sliming-span	All	1	Longer sliming-span	Moderate to high mucilage content even after one week after harvest	Asontem	≥
Okra marketers	Sales and profit	Sliming-span	All	1	Longer sliming-span	Moderate to high mucilage content even after one week after harvest	Asontem	≥
		Shelf-life	All	3	Longer shelf-life	Less fruit deterioration without refrigeration	None	None
Consumers	Satisfaction	Shelf-life	All	3	Longer shelf-life	Store better after one week after harvesting	None	None
		Sliming-span	All	1	Longer sliming-span	Moderate to high mucilage content even after one week after harvest	Asontem	≥
		Fruit appearance	All	1	Fruit colour	Green to deep green	JKOH540	≥



Well-watered okra



Drought-stressed okra

“The carefully crafted product profile functions as a roadmap. It provides clear directions for developing okra varieties that will be embraced and favored by our clients because it meets the needs of our valued customers”